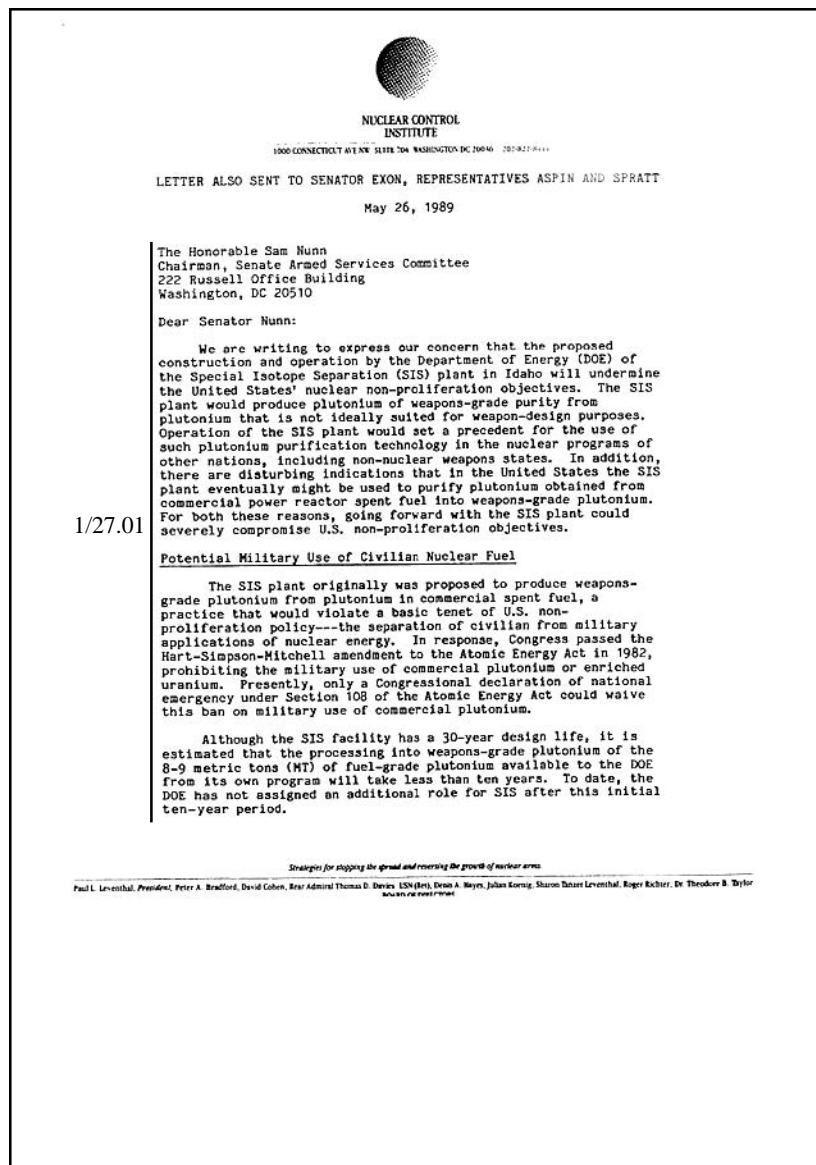
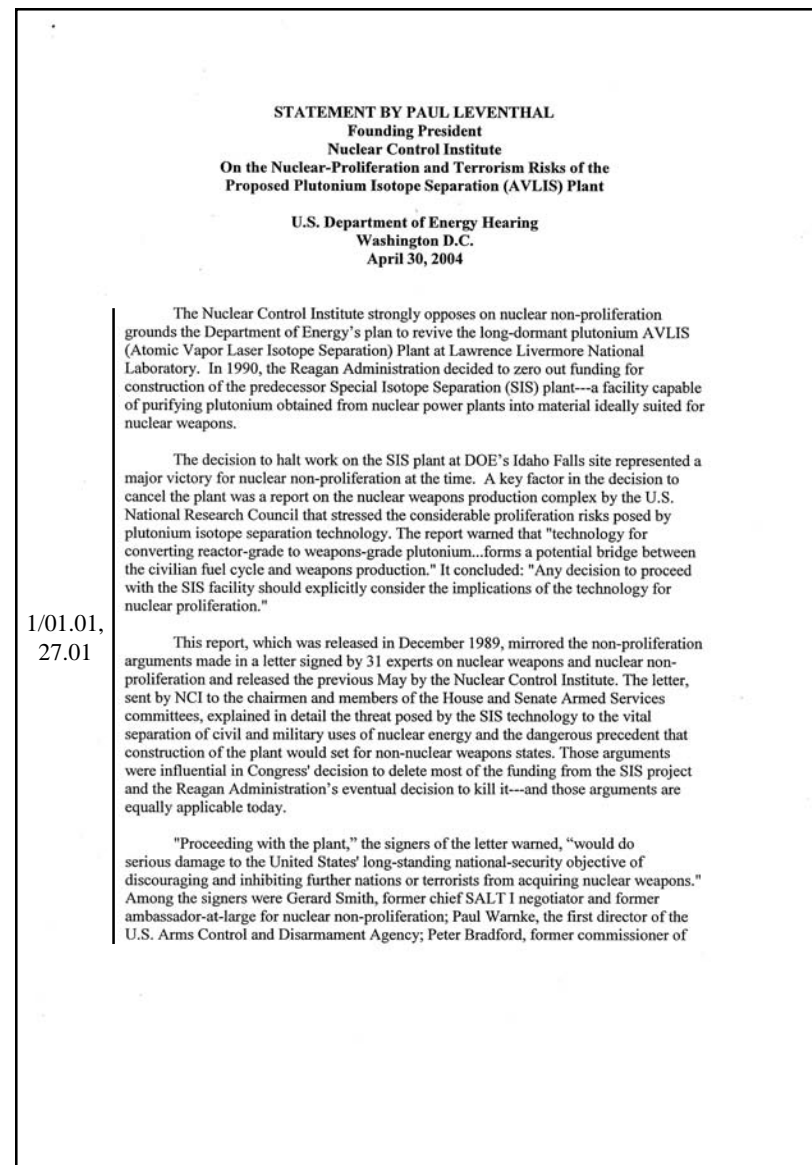


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cont.

the Nuclear Regulatory Commission; Russell Peterson, former director of the Congressional Office of Technology Assessment, Freeman Dyson of the Princeton Institute for Advanced Study, as well as several other academic and independent experts on nuclear weapons matters. (See attached letter.)

The experts asserted that construction and operation of the SIS plant would threaten U.S. non-proliferation objectives without providing offsetting national-security benefits. They cited four specific concerns:

- First, DOE had told Congress that commercial power reactor spent fuel is a "potential" plutonium source for the SIS plant; "a practice that would violate a basic tenet of U.S. non-proliferation policy the separation of civilian from military applications of nuclear energy."

- Second, completion of the SIS plant could lead to the "spread of SIS-type laser technologies world-wide and would pose "unprecedented challenges to containing the nuclear programs of emerging and advanced industrial nations to exclusively peaceful purposes."

- Third, future operation of SIS-type facilities in non-nuclear weapons states would present a formidable safeguards task for the International Atomic Energy Agency (IAEA). Processing and storage of unprecedented quantities of a number of plutonium isotopes would require development of a new safeguards regime for which the IAEA "has no previous experience and is ill-equipped."

- Finally, the plutonium purification processes carried out in an SIS plant could inadvertently "completely thwart" an important technical means to verify future arms reduction agreements, thereby having "an unintentional, adverse effect on the verification of arms control agreements between the United States and the Soviet Union."

The experts concluded: "In view of the acknowledged surplus of plutonium in the U.S. nuclear arsenal, there are no clear national-security benefits that offset the obvious nuclear proliferation and terrorism risks, as well as safeguards and verification problems, posed by the planned construction and use of the SIS plant."

It is by no means clear that there are national-security benefits today that would justify DOE's planned revival of the plutonium laser isotope separation plant at Livermore. The Site-Wide Environmental Impact Statement for Lawrence Livermore National Laboratory speaks only of "a need for augmentation of the current inventory of special nuclear material (e.g. plutonium, enriched uranium) to support the Stockpile Stewardship certification activities." The type of plutonium needed is not specified, but it is widely assumed that Pu-242 is needed for hydrodynamic testing of a mock-up nuclear weapon during which the high explosives are detonated and the resulting motions and reactions of materials and components are measured.

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But there is no analysis of why this isotope of plutonium could not be produced by simply irradiating target material in an operating reactor within the DOE complex as had been done in the production reactors at the Savannah River Site before they were shut down. Equally troubling is the absence of any discussion in the EIS of what mission the plutonium isotope separation plant, with a 30-year design life, would be given after any campaign to separate Pu-242 is completed.

The predecessor SIS plant was supposed to process 8-9 metric tons of DOE fuel-grade plutonium into weapons-grade plutonium over less than 10 years, and it had not been assigned an additional role after that work was completed. This was a matter of considerable concern at the time because DOE's Acting Assistant Secretary for Defense had testified before the House Armed Services Committee that commercial spent fuel "is a potential" plutonium source for the SIS facility, although not part of present planning for the facility because a "major change in law" would be required.

The law he was referring to is the Hart-Simpson-Mitchell amendment to the Atomic Energy Act in 1982, prohibiting the military use of commercial plutonium or enriched uranium. It was enacted directly in response to DOE's original mission for the SIS plant to produce weapons-grade plutonium from plutonium in commercial spent fuel, a practice that would have violated a basic tenet of U.S. non-proliferation policy ---the separation of civilian from military applications of nuclear energy. Under the statute, only a Congressional declaration of national emergency under Section 108 of the Atomic Energy Act could waive this ban on military use of commercial plutonium.

Given this troubling history, it is as important to get assurances of what the plutonium isotope separation plant will not be used for as it is to get details of what the plant would be used for. Unless potential use of the plant as a bridge between military and civilian applications of nuclear energy is specifically ruled out, there is a strong likelihood that DOE will find a way to bridge the gap.

The Bush-Cheney energy plan, released in May 2000, makes clear that this Administration is favorably disposed toward the reprocessing of commercial nuclear power plant spent fuel. The energy plan cites the reprocessing experience of Britain, France and Japan as an example for the United States to follow. There are high costs, severe security risks, unresolved waste disposal problems and mounting stockpiles of unwanted plutonium associated with these programs. Yet, the nuclear industry and its allies on Capitol Hill have been pushing the Bush Administration to reverse the decisions against reprocessing made in the Ford, Carter and Reagan Administrations and to follow the Europeans and Japanese instead.

A major defect of the site-wide Livermore EIS is that there is no non-proliferation analysis of the impact of the plutonium AVLIS program. NCI's position is that proliferation implications of the AVLIS plant must be included in the SWEIS and thoroughly analyzed before any decision on proceeding with the plant is made. A non-proliferation impact analysis should be prepared and made an integral part of the EIS and subject to review under the terms of the National Environmental Protection Act (NEPA).

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The review should include a thorough analysis of the impacts of laser-separation technology which, if developed and applied at Livermore, could be disseminated or otherwise stimulate development of such plants in non-nuclear weapon states under civilian auspices for production of weapons-grade plutonium.

An example of past dissemination by DOE of military nuclear technology was the transfer to Japan in the 1980s by Oak Ridge National Laboratory of breeder-blanket reprocessing technology for the separation of weapons-grade plutonium. The Oak Ridge blueprints were used for the design of Japan's Recycle Equipment Test Facility (RETF). This was deemed by DOE not to be a transfer of "sensitive nuclear technology" prohibited from export to a non-nuclear weapons state on the grounds Japan already had a civilian reprocessing program, albeit one applied to spent fuel, not breeder blanket material. The same logic could apply to future transfer of plutonium AVLIS technology to Japan on grounds that Japan already has a laser program albeit for fusion-development not plutonium-refinement purposes.

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cont.

The proliferation significance of AVLIS technology has been made all the more apparent by Iran's admission last fall to the IAEA that it had been secretly pursuing a laser-based uranium-enrichment program since 1991. Previously, Iran had acknowledged to the IAEA a research and development program involving lasers, but not an enrichment program. Given the urgency of U.S. efforts to win wide international support for shutting down Iran's nuclear weapons program, this is surely precisely the wrong time to start up a nuclear-weapons AVLIS program at Livermore National Laboratory.

In conclusion, DOE would be well advised to apply to the plutonium AVLIS facility the advice offered by the U.S. National Research Council in 1989 with regard to the SIS plant: "Any decision to proceed...should explicitly consider the implications of the technology for nuclear proliferation."

NCI

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NUCLEAR CONTROL  
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LETTER ALSO SENT TO SENATOR EXON, REPRESENTATIVES ASPIN AND SPRATT

May 26, 1989

The Honorable Sam Nunn  
Chairman, Senate Armed Services Committee  
222 Russell Office Building  
Washington, DC 20510

Dear Senator Nunn:

We are writing to express our concern that the proposed construction and operation by the Department of Energy (DOE) of the Special Isotope Separation (SIS) plant in Idaho will undermine the United States' nuclear non-proliferation objectives. The SIS plant would produce plutonium of weapons-grade purity from plutonium that is not ideally suited for weapon-design purposes. Operation of the SIS plant would set a precedent for the use of such plutonium purification technology in the nuclear programs of other nations, including non-nuclear weapons states. In addition, there are disturbing indications that in the United States the SIS plant eventually might be used to purify plutonium obtained from commercial power reactor spent fuel into weapons-grade plutonium. For both these reasons, going forward with the SIS plant could severely compromise U.S. non-proliferation objectives.

Potential Military Use of Civilian Nuclear Fuel

The SIS plant originally was proposed to produce weapons-grade plutonium from plutonium in commercial spent fuel, a practice that would violate a basic tenet of U.S. non-proliferation policy---the separation of civilian from military applications of nuclear energy. In response, Congress passed the Hart-Simpson-Mitchell amendment to the Atomic Energy Act in 1982, prohibiting the military use of commercial plutonium or enriched uranium. Presently, only a Congressional declaration of national emergency under Section 108 of the Atomic Energy Act could waive this ban on military use of commercial plutonium.

Although the SIS facility has a 30-year design life, it is estimated that the processing into weapons-grade plutonium of the 8-9 metric tons (MT) of fuel-grade plutonium available to the DOE from its own program will take less than ten years. To date, the DOE has not assigned an additional role for SIS after this initial ten-year period.

*Strategies for stopping the spread and reversing the growth of nuclear arms.*

Paul L. Leventhal, President; Peter A. Bradford, David Cohen, Rear Admiral Thomas D. Davies USN (Ret), Denis A. Hayes, Julian Koenig, Sharon Tenner Leventhal, Roger Richter, Dr. Theodore B. Taylor  
www.nuclearcontrol.org

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However, the FY 1989 DOE Congressional Budget Request describes the SIS plant as allowing for "sprint/surge" capacity. Another source of fuel-grade plutonium will be necessary to achieve this "sprint/surge" capacity after the DOE's supply of plutonium is exhausted within ten years of start-up. As recently as March, 1989, DOE Acting Assistant Secretary for Defense Programs, Troy Wade, testified before the House Armed Services Committee that commercial spent fuel "is a potential" as a plutonium source for the SIS facility, although not part of present planning for the facility because a "major change in law" would be required.

Proliferation of SIS Technologies

The new technologies incorporated into the SIS plant pose unprecedented challenges to containing the nuclear programs of emerging and advanced industrial nations to exclusively peaceful purposes.

The production-scale demonstration of the Atomic Vapor Laser Isotope Separation (AVLIS) technology at the SIS facility is likely to be cited by other nations as precedent for their own development and use of AVLIS technology for the purification of plutonium. This will increase nuclear proliferation and terrorism risks in non-nuclear weapons states that are now beginning to reprocess commercial spent fuel to separate out plutonium for use as fuel in nuclear power reactors.

A non-weapons state could seek to justify AVLIS plutonium purification on the grounds that it would increase the efficiency of burning plutonium fuel in reactors and reduce radiation exposure to workers who fabricate the fuel. But purification would make plutonium far more attractive than it already is to nations or terrorists for constructing nuclear explosive devices. Spread of SIS technology thus would increase the risk of diversion or theft of plutonium for use in weapons.

Operation of an SIS-type plant in a non-weapons state could produce unprecedented amounts of purified plutonium 239, the primary explosive ingredient in nuclear weapons. Production of plutonium 239 on this scale in a non-weapons state would enable such a country to undertake a sizable nuclear weapons program.

The Safeguards/Verification Burden

The safeguarding of an SIS-type plant by the International Atomic Energy Agency (IAEA) would present a formidable task for which the IAEA has no previous experience and is ill-equipped. Aside from purified plutonium 239, safeguards would have to be applied to unprecedented quantities of the isotopes 240 and 241 that would be separated out in the purification process. For example, an estimated 1/2 metric ton (MT) of plutonium 240 would

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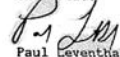
be produced in the purification of the 8-9 MT of fuel-grade plutonium now available to the SIS plant, representing a new safeguards burden to DOE. Both forms of plutonium must be safeguarded because they represent potential, although not ideal, materials for use in weapons.

Furthermore, the operation of an SIS plant could have an unintentional adverse effect on verification of future arms-reduction agreements between the United States and the Soviet Union. The possibility of arms-control verification of nuclear warheads by the passive detection of neutron emissions could be completely thwarted by using the SIS plant to "clean up" the plutonium used in existing warheads in order to reduce the plutonium 240 concentration from 6 per cent to about .01 per cent.

We urge you to reconsider the Department's planned construction of the SIS plant. Proceeding with the plant would do serious damage to the United States' long-standing national-security objective of discouraging and inhibiting further nations or terrorists from acquiring nuclear weapons. In view of the acknowledged surplus of plutonium in the U.S. nuclear arsenal, there are no clear national-security benefits that offset the obvious nuclear proliferation and terrorism risks, as well as safeguards and verification problems, posed by the planned construction and use of the SIS plant.

Thank you for your attention to this important matter.

Sincerely,

  
Paul Leventhal

President, Nuclear Control Institute, on  
behalf of himself and the following co-signers:

Dean E. Abrahamson	Denis Hayes	David Ozonoff
Peter Bradford	William A. Higinbotham	Russell Peterson
Peter Clausen	Milton M. Hoenig	George Rathjens
Thomas Davies	Robert C. Johansen	Judith V. Reppy
Kreeman Dyson	Allan Krass	Roger Richter
Harold Feiveson	Betty Lall	Gerard Smith
Bernard Feld	Jennifer Leaning	Theodore B. Taylor
Donald Geesaman	John Marshall Lee	Kosta Tsipis
David Hafemeister	Franklin A. Long	Frank von Hippel
Chalmers Hardenbergh	Michael Nacht	Paul Warnke

cc: Members of the Armed Services Committee

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## SIGNERS OF THE SIS LETTER

May 26, 1989

Dean E. Abrahamson is a professor at the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs.

Peter Bradford is a former commissioner of the Nuclear Regulatory Commission.

Peter Clausen, formerly an analyst for the Department of Energy and the Central Intelligence Organization, is director of research for the Union of Concerned Scientists.

Rear Admiral Thomas Davies (Ret.), former assistant director of the U.S. Arms Control and Disarmament Agency, was head of its non-proliferation bureau and was chairman of the U.S. delegation to test ban and environmental warfare negotiations.

Freeman Dyson, professor of physics at Princeton's Institute for Advanced Study, has been a consultant to the Defense Department and the U.S. Arms Control and Disarmament Agency.

Harold Feiveson, a research scientist at Princeton University, is a former member of the science bureau of the U.S. Arms Control and Disarmament Agency.

Bernard Feld is a professor of physics at the Massachusetts Institute of Technology.

Donald Geesaman is a professor at the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs.

David Hafemeister, professor of physics at the California Polytechnic University, is a former special assistant to the Undersecretary of State on non-proliferation matters.

Chalmers Hardenbergh is editor of the Arms Control Reporter, a publication of the Institute for Defense and Disarmament Studies.

Denis Hayes, former director of the U.S. Solar Energy Research Institute, is now chief executive officer and chairman of Renew America.

William A. Higinbotham is a consultant to the Technical Support Organization of the Department of Nuclear Energy at Brookhaven National Laboratory.

Milton M. Hoenig, scientific director of the Nuclear Control Institute, was at the U.S. Arms Control and Disarmament Agency in 1979-80.

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Robert C. Johansen is a senior fellow at the University of Notre Dame's Institute for International Peace Studies.

Allan Krass is a professor of physics and science policy at Hampshire College.

Betty Lall is director of arms control verification studies at the Council on Economic Priorities.

Jennifer Leaning, M.D. is chief of emergency medical services of the Harvard Community Health Plan.

John Marshall Lee is a retired vice admiral, U.S. Navy.

Paul Leventhal, president of the Nuclear Control Institute, formerly was on U.S. Senate staff with principal responsibility for efforts leading to enactment of the Nuclear Non-proliferation Act of 1978.

Franklin A. Long, professor emeritus of chemistry at Cornell University, is a former assistant director of the U.S. Arms Control and Disarmament Agency.

Michael Nacht is a professor in the School of Public Affairs at the University of Maryland.

David Ozonoff, M.D. is chief of the Environmental Health Section of the Boston University School of Public Health.

Russell Peterson, vice-chairman of the Better World Society and president emeritus of the Audobon Society, is a former director of the Congressional Office of Technology Assessment.

George Rathjens, professor of political science at the Massachusetts Institute of Technology, was chief scientist in the Office of the Special Assistant to the President for Science and Technology.

Judith V. Reppy is associate director of the Peace Studies Program at Cornell University.

Roger Richter is a former nuclear safeguards inspector of the International Atomic Energy Agency who served in the Euratom section.

Gerard Smith, chairman of Consultants International Group Inc. and of the Arms Control Association, was chairman of the U.S. SALT I delegation and former Special Representative and Ambassador-at-Large for Non-proliferation Matters.

Theodore B. Taylor is a consulting physicist and former deputy director for technology at the Defense Nuclear Agency.

Kosta Tsipis is director of the Massachusetts Institute of Technology's Program in Science and Technology for International Security.

Frank von Hippel is a faculty affiliate of the Center for Energy and Environmental Studies and Center for International Studies at Princeton University.

Paul Warnke is a former Assistant Secretary of Defense (ISA) and director of the U.S. Arms Control and Disarmament Agency.